

REMARKS

The Office Action dated March 23, 2004 presents the examination of claims 1-7, 20-25, 28-31, 37, 43, 45, 47, 49, and 51. Claims 8-19, 26-27, 32-36, 38-42, 44, 46, 48, 50, and 52-69 are withdrawn from consideration. Claims 1, 3-4, 7-23, 26-42, 44, 46, 48, 50, and 52-69 are canceled without prejudice or disclaimer of the subject matter recited therein. Claims 2, 5-6, 24-25, 43, 45, and 51 are amended. Claim 70 is added. Support for subject matter recited in claims 24 and 70 is found in the specification, such as in Examples 11-14 (pages 142-147). Minor idiomatic, grammatical, and/or dependency amendments are made to claims 2, 5-6, 25, 43, 45, and 51. Upon entry of this Reply, claims 2, 5-6, 24-25, 43, 45, 47, 49, 51, and 70 will be pending. No new matter is inserted into the application.

Restriction Requirement

The Examiner maintains the restriction requirement such that claims 8-19, 26-27, 32-36, 38-42, 44, 46, 48, 50, and 52-69 are withdrawn from consideration. Claims 8-19, 26-27, 32-36, 38-42, 44, 46, 48, 50, and 52-69 are canceled, thus rendering the Restriction Requirement moot.

Priority

The Examiner states that Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. § 120, in that a specific reference to the prior application(s) in the first sentence of the specification has not been made. The specification is amended herein to recite that the present application is a Continuation-In-Part of co-pending Application No. 09/302,357, filed on April 30, 1999, and for which priority is claimed under 35 U.S.C. § 120; and that the present application claims priority of Application Nos. 120553/1998, 281127/1998, 330981/1998, and 054730/1999 filed in Japan on April 30, 1998, October 2, 1998, November 20, 1998, and March 2, 1999, respectively, under 35 U.S.C. § 119. Further, the entire contents of all of the above-referenced applications are incorporated by reference. Applicants respectfully submit that all requirements of 35 U.S.C. §§ 120 and 119 are therefore satisfied.

Information Disclosure Statement

The Examiner states that the Derwent Abstract of WO 98/42852 reference listed on the Form PTO-1449 submitted with the IDS of October 27, 2000 is improper, and replaces therefor the foreign patent document WO 98/42852. Applicants note, however, that the

Examiner did not initial the handwritten citation of WO 98/42852 on the Form PTO-1449. A copy of the Form PTO-1449 containing the Examiner's handwritten citation is attached hereto for the Examiner's convenience. Applicants respectfully request that the Examiner initial and return the Form PTO-1449 as evidence of his consideration thereof.

Objection to the Specification

Abstract

The Examiner objects to the abstract. Applicants submit herewith a corrected abstract as required by the Examiner. Thus, the instant objection is overcome.

Title

The Examiner objects to the title for allegedly not being descriptive, and requires a new title. In response to the Examiner's remarks, Applicants amend the title to --METHOD FOR PRODUCING TRANSGENIC PLANTS RESISTANT TO WEED CONTROL COMPOUNDS WHICH DISRUPT THE PORPHYRIN PATHWAYS OF PLANTS--. Thus, the instant objection is overcome.

Summary of the Invention

The Examiner objects to the specification for containing claim numbers in the summary of the invention. In response to the Examiner's remarks, the claim numbers are removed from the brief summary of the invention. Thus, the instant rejection is overcome.

Rejection under 35 U.S.C. § 112, second paragraph

The Examiner rejects claims 1-7, 20-25, 28-31, 37, 43, 45, 47, 49, and 51 under 35 U.S.C. § 112, second paragraph for allegedly being indefinite. Claims 1, 3-4, 7, 20-23, 28-31, and 37 are canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Pending Claims

The Examiner asserts that the claims, in general, fail to conform to standard U.S. claim language, and requires appropriate correction thereof. Claim 24, as amended, is directed to a method for producing a transgenic plant which is resistant to a weed control compound, comprising the steps of introducing into a plant

cell, a nucleotide sequence encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence; expressing the nucleotide sequence; and regenerating said plant cell into a transgenic plant. All of the pending claims directly or indirectly depend on claim 24. Applicants respectfully submit that the pending claims clearly and distinctly recite the present invention. Thus, the instant rejection is overcome.

Claim 2

The Examiner points out that the recitation of "the form" lacks antecedent basis. Claim 2, as amended, does not recite "the form." Thus, the instant rejection is overcome.

Claims 24-25

The Examiner asserts that the term "variant" is indefinite. Claim 24, as amended, recites a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence. Thus, the variant is defined in that it represents plant protoporphyrinogen IX oxidase having a nucleotide sequence wherein the FAD binding sequence is lacking. Such a variant is disclosed, for example, on page 82, lines 1-7 of the instant specification. Applicants respectfully submit that the pending claims clearly and distinctly recite the present invention. Thus, the instant rejection is overcome.

Claim 45

The Examiner points out that the phrase "the weed control compound" lacks antecedent basis. Claim 45 is amended to recite "a weed control compound." Thus, the instant rejection is overcome.

Rejection under 35 U.S.C. § 112, first paragraph

Written Description

The Examiner rejects claims 1-7, 20-25, 28-31, 37, 43, 45, 47, 49, and 51 under 35 U.S.C. § 112, first paragraph for an alleged lack of written description in the specification. Claims 1, 3-4, 7, 20-23, 28-31, and 37 are canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Independent claim 24, as amended, is directed to a method for producing a transgenic plant which is resistant to a weed control compound. In the inventive method, a nucleotide sequence encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence is introduced into a plant cell. The nucleotide sequence is expressed and the plant cell is regenerated into a transgenic plant.

The Examiner asserts that the specification does not describe a genus of polynucleotides encoding a variant protoporphyrinogen IX oxidase which has no capability of oxidizing protoporphyrinogen IX. As noted above, however, the "variant" recited in claim 24 is a variant of plant protoporphyrinogen IX oxidase having a nucleotide sequence that lacks the FAD binding sequence. Such a variant is disclosed, for example, on page 82, lines 1-7 of the instant specification.

The portion of the nucleotide sequence of a plant protoporphyrinogen IX oxidase which corresponds to the FAD binding site is described in detail on page 82 *et seq.* of the specification. Specifically, the consensus amino acid sequence of the FAD binding site is described as GXGXXG, wherein X is any amino acid. As an example thereof, the specification discloses that the FAD binding site in the PPO sequence from *Arabidopsis thaliana* is GGGISG and is located at amino acid positions 63 to 68 from the N-terminus.

Nucleotide sequences which encode protoporphyrinogen IX oxidases from various organisms are well known in the art, as noted on page 89, lines 4-11 of the specification. For example, WO 97/32011 (already of record in the present application) provides an alignment of PPO amino acid sequences from various plants in Table 1. A copy of Table 1 from WO 97/32011 is attached hereto for the

Examiner's convenience. The consensus sequence disclosed in the present application can be readily seen in the alignment presented in Table 1. Specifically, the Examiner's attention is drawn to the amino acids presented at positions 84 through 89 of Table 1 (pages 53 and 54). Therein, the Examiner will note that seven of the PPO amino acid sequences presented in Table 1 possess the GXGXXG consensus sequence. It is understood, therefore, by a person skilled in the art that the consensus sequence is conserved in any PPO listed therein.

Based on the description in the instant specification and information that is known and readily available in the art, the skilled artisan can obtain a polynucleotide sequence encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence. Accordingly, the instant specification provides adequate written description for a genus of polynucleotides encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence.

Finally, methods for introducing a nucleotide sequence into a plant cell and expressing said sequence, as well as regenerating a plant cell into a transgenic plant are well known in the art.

Taken together, it is clear that Applicants were in possession of the subject matter recited in the instant claims at the time the

present application was filed. Accordingly, the requirements of 35 U.S.C. § 112, first paragraph are met. Withdrawal of the instant rejection is therefore respectfully requested.

Enablement

The Examiner also rejects claims 1-7, 20-25, 28-31, 37, 43, 45, 47, 49, and 51 under 35 U.S.C. § 112, first paragraph for an alleged lack of enablement by the specification. Claims 1, 3-4, 7, 20-23, 28-31, and 37 are canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Independent claim 24, as amended, is directed to a method for producing a transgenic plant which is resistant to a weed control compound. In the inventive method, a nucleotide sequence encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence is introduced into a plant cell. The nucleotide sequence is expressed and the plant cell is regenerated into a transgenic plant. As discussed above, the instant specification discloses a genus of polynucleotides encoding a variant of plant protoporphyrinogen IX oxidase that lacks the FAD binding sequence. Further, methods for introducing a nucleotide sequence into a plant

cell and expressing said sequence, as well as regenerating a plant cell into a transgenic plant are well known in the art.

Given this information, it is well within the ordinary skill of the average artisan to practice the claimed methods or produce the claimed plants without undue experimentation. Hence, the present invention, as defined in the claims, is enabled such that the requirements of 35 U.S.C. § 112, first paragraph are met. Withdrawal of the instant rejection is therefore respectfully requested.

Prior Art

As noted by the Examiner, the variant protoporphyrinogen IX oxidase utilized in the present invention has no capability of oxidizing protoporphyrinogen IX. Applicants respectfully submit that the pending claims are free of prior art, which fails to disclose or fairly suggest a method for producing a transgenic plant expressing said variant.

Conclusion

Applicants respectfully submit that the above remarks and/or amendments fully address and overcome the outstanding rejections and objections. For the foregoing reasons, Applicants respectfully

request the Examiner to withdraw all of the outstanding rejections and objections, and to issue a Notice of Allowance indicating the patentability of the present claims. Early and favorable action of the merits of the present application is thereby respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kristi L. Rupert, Ph.D. (Reg. No. 45,702) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of three (3) months to September 23, 2004, in which to file a reply to the Office Action. The required fee of \$950.00 is enclosed herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees

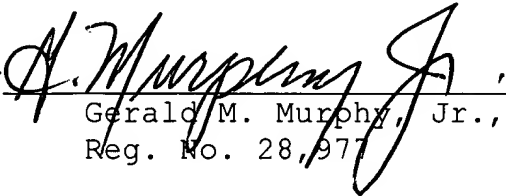
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required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By


Gerald M. Murphy, Jr.,
Reg. No. 28,977


GMM/KLR

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

Attachments: Abstract
Pages 53-57 of W097/32011
Form PTO-1449